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U. S. Department of Agriculture, Forest Service,  
Southern Forest Experiment Station  
Division of Forest Insect Research

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IPS ENGRAVER BEETLES  
(Ips avulsus, I. grandicollis, and I. calligraphus) //

Importance

1. Cause mortality to commercial- and sapling-size pine following drought, fire, hail, ice storms, etc. Almost always found in lightning-struck trees.
2. Prefer low-vigor trees, slash, fresh-cut logs and stumps.
3. Infested trees typically scattered through forest. Accumulated damage is very high.
4. May kill groups of trees in localized areas when conditions are in their favor.
5. Carry blue stain fungus which becomes established in tree and causes degrade in lumber cut from it.

Habits

1. The three species of Ips beetles girdle cambial region. They are unlike in size and habit of living in different parts of tree.

(a) I. avulsus, the smallest (1/8-inch long), attack crowns of large trees and trunks of small trees. Breed in slash and may spread to crowns of nearby timber following logging operations and during dry seasons. Sometimes kill one branch at a time or, when abundant, may suddenly involve entire crown. When aggressive may pave way for other Ips beetles and the southern pine beetle. Build up during intermittent logging operations.

(b) I. grandicollis, medium-sized (about 3/16-inch long), commonly attack middle and upper trunk.

(c) I. calligraphus, the largest (about 1/4-inch long), generally infest the lower trunk.

2. The three species of Ips beetles may work together in same tree, their tunnels overlapping; or they may work independently or in succession. They may also become associated with southern pine beetles and black turpentine beetles.
3. There may be four or five generations per year.



## Symptoms

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1. Numerous pinkish or red-brown (sometimes whitish) pitch-tubes, about the size of a wad of gum, on bark of branches, tops, middle and/or lower trunk.
2. In low-vigor trees, pitch-tubes lacking. Reddish boring dust in bark crevices, and spider webs at base of tree.
3. Sometimes only crowns infested, no pitch-tubes present, and foliage but slightly faded when broods ready to leave. Sometimes crowns turn yellow or red, limb by limb.
4. More or less straight Y-shaped or H-shaped egg tunnels, running parallel to grain of wood, engraved on surfaces of wood and inner bark. Wavy and less distinct larval mines running laterally from main tunnels. Egg tunnels free of boring dust.
5. Beetles tan, brown, or black, according to age; 1/8- to 1/4-inch long; hind end of body appearing chopped-off or shovel-shaped.

## Control

When infested trees are widely scattered, control is generally not recommended because of cost.

If control is necessary, the following methods may be applied:

1. Cut-salvage with burning of slabs at mill. Burn or spray infested tops and stumps.
2. When trees cannot be quickly salvaged, cut and spray infested tops, trunks, and stumps.
3. Burn or spray slash immediately following logging operations on poor sites or during drought years.

### 4. Spray formula

The recommended spray for controlling Ips bark beetles is 0.25 percent gamma isomer benzene hexachloride in No. 2 diesel oil. This may be prepared in the following way:

Stir one gallon of benzene hexachloride concentrate (containing one pound of gamma isomer per gallon) into about 50 gallons of No. 2 diesel oil. Spray costs about 19 cents per gallon.

BHC concentrate can be purchased in 5-gallon containers and 53-gallon drums.

### 5. Application of spray

Use about one gallon of spray for 100 square feet of bark surface. Thoroughly cover all surfaces of infested material until spray begins to run off. Turn logs and tops, if necessary, to cover under side.





Total cost of cut-spray treatment varies from about \$1.20 to \$2.50 or more per tree, depending mainly upon tree size, accessibility and concentration of outbreak.

6. Where drought is the primary cause of unusual Ips beetle activity, soaking rains will generally stop the infestation. Under such circumstances, the feasibility of salvage rather than spray should be considered.

#### Most Important Features

1. When control methods are necessary, make every attempt to keep ahead of the spread of insect by treating only trees that have broods within. Usually crowns are still green or but slightly faded when broods are ready to leave the trees. When foliage turns red, beetles have usually (but not always) left. Do not treat vacated red-tops and overlook nearby infested green-tops.

2. Avoid beetle build-up in slash following logging operations.

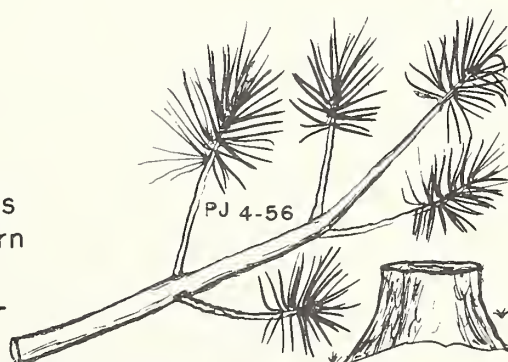
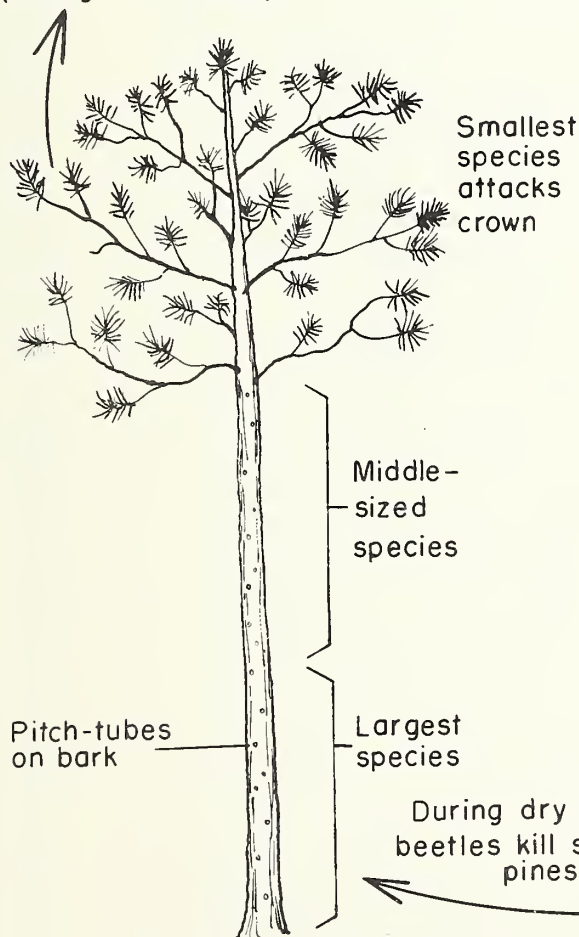
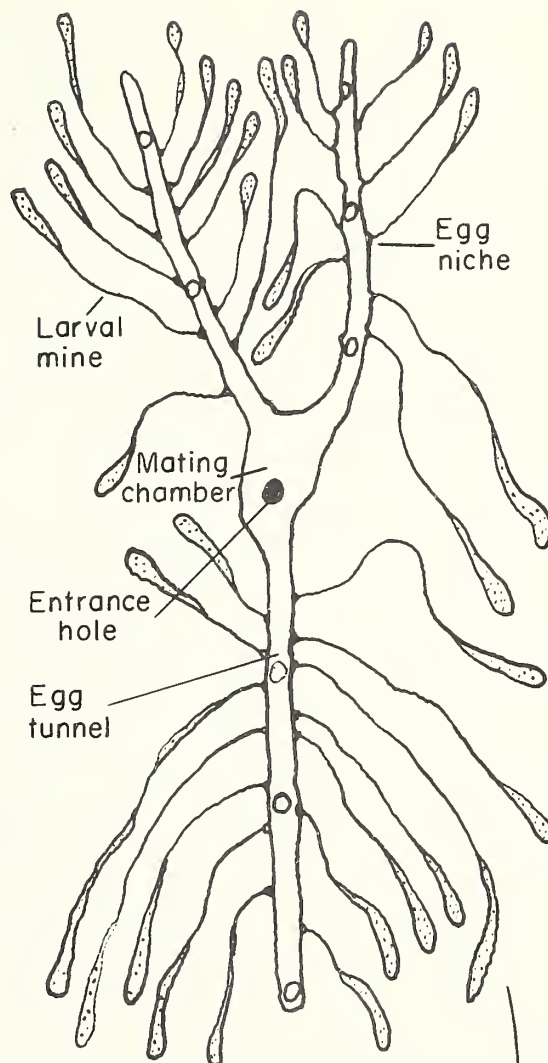
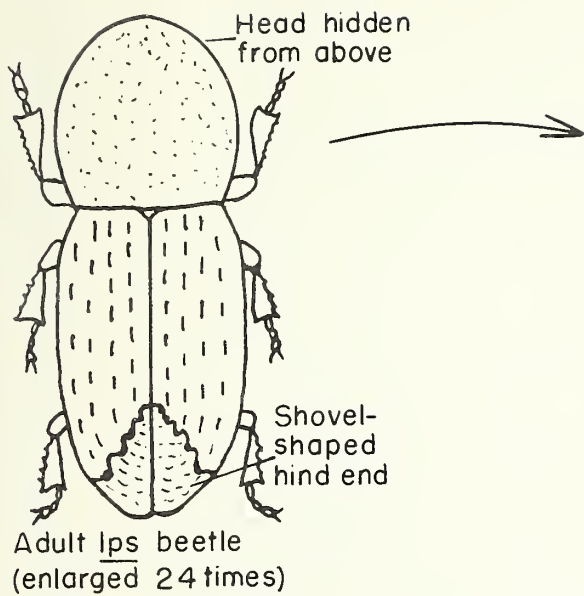
3. Be aware of the aggressiveness of the small Ips avulsus. Indications of its presence in the crowns may not be noticeable except to an experienced spotter or with the aid of binoculars.

#### Precautions

Benzene hexachloride is poisonous. Keep insecticide off skin and away from eyes and nose. Wash carefully with soap and warm water after applying spray.

Revised October 1956





Three species of Ips may attack at same time or work separately.

Normally live in logging tops, stumps, lightning- or fire-scorched trees.

During dry periods beetles kill southern pines

*Ips* engraver beetle.





